

REMARKS

Claims 1-24 are pending in the current application. The Office rejected claims 1-24. Claims 1-8 were rejected under 35 U.S.C. § 102 and claims 9-24 were rejected under 35 U.S.C. § 103. The Applicant asserts that these claims were improperly rejected.

35 U.S.C. § 102 Rejections

Claims 1-8 are rejected under 35 U.S.C. § 102(b) as being anticipated by Padawer et al. (U.S. Pat. No. 5,484,121). The Applicant believes that claims 1-8 are patentably distinguishable from Padawer, as Padawer does not teach each and every feature of the claims.

Independent Claim 1

Looking first to claim 1, Padawer does not show "an electromagnetic radiation emitter and an array of sensors, the emitter being located intermediate of the array of sensors and at least some of the sensors being located at different distances from the emitter."

The Office first directs the Applicant to element 40 in FIG. 3a to show that Padawer teaches an array of sensors. However, element 40 and FIG. 3a do not teach an array of sensors as required by claim 1. Rather, it is clear from FIG. 3a and the description at col. 2, lines 44-47 that this arrangement comprises only a single detector element 40. Accordingly, FIG. 3a fails to teach an array of sensors, as required by the present invention.

Further, Padawer does not teach having at least some of the array of sensors located at different distances from the emitter. The Office asserts that Padawer, in col. 2, lines 33-35, discloses an arrangement having an emitter located intermediate of an array of sensors and at least some of the sensors being located at different distances from the emitter.

However, the cited passage merely indicates that "the sensor and detector are mounted a small distance apart and may have their principal axes tilted slightly towards each other." This is distinctly different from the present invention, which comprises multiple sensors that are located at different distances from the emitter.

Padawer gives no consideration or thought as to whether and why the contemplated apparatus should comprise more than one sensor. Further, Padawer gives no consideration as to why and how such sensors should be located at different distances from the source to achieve the advantages of the present invention as will be described below.

The Applicant notes that various arrangements are briefly described in FIGS. 3c, 3e, and 3f, but that none of these arrangements exhibit all of the required features of claim 1.

Specifically, FIG. 3c and col. 2, lines 57-58 merely relate to "optical fibers joining into a larger cable" with no further information as to the disposition of the sensors relative to each other and relative to the position of the source. It is not taught that the emitter should be located intermediate of the array of sensors as required by the claims.

With reference to FIGS. 3e and 3f, circular or annular arrangements are centered on the emitter or concentric about the emitter such that each detector is located the same distance from the emitter. However, the claims require that at least some of the sensors be located different distances from the emitter.

Independent Claim 8

For the reasons argued above, independent claim 8 is also novel over Padawer. Claim 8 requires detection by an array of sensors. The Office again cites element 40 and FIG. 3a for

this teaching. However, as stated above, this only teaches the use of a single sensor, not an array of sensors.

Moreover, Padawer does not teach placing at least some of the sensors at different distances from the emitter and comparing the detected intensity of the diffused radiation at a particular distance from the emitter to a respective predetermined value to determine the type of accreted ice.

Padawer provides no information about why and how various sensors may be mounted together to obtain the advantages of the present invention. The varied spatial distribution of sensors in the present invention leads to a more efficient ice detection system, as the information collected concerns a volume of ice.

In contrast, Padawer teaches a system having a much more localized area of detection. The configuration of Padawer results in a less reliable detection of ice, since a localized accretion of ice on the sensors would lead to a false positive, even though little or no ice is found in the surrounding area. Additionally, if the sensors are located at different distances from the emitter, they can advantageously collect electromagnetic radiation emitted by the emitter at different distances from the emitter. Accordingly, the amount and nature of the information collected by the present invention is far more than what was contemplated in the prior art, for example, in terms of reliability.

The claimed arrangement of the array of sensors provides further advantages. An array of sensors is far better adapted to detect ice on aircraft surfaces, such as the leading edge of wings or on other large surfaces. Additionally, the arrangement of the sensors in the present invention makes any fiber network downstream from the sensors much less sensitive to optical crosstalk. This is because, in contrast to the arrangements taught in the prior art, the sensors of the present invention are positioned in an array at different

distances from the emitter such that the density of fibers (which may be connected to the sensors) is particularly limited.

Therefore, it is submitted that independent claim 1, as well as claims 2-7 which depend thereupon, and independent claim 8 are patentable over Padawer. Accordingly, it is respectfully requested that the rejection under Padawer be withdrawn.

35 U.S.C. § 103 Rejections

Claims 9-24 were rejected under 35 U.S.C. § 103. Of these claims, only claim 15 is an independent claim. Claims 9-14 depend upon independent claim 8 and claims 16-24 depend upon claim 15.

Independent Claim 15

Independent claim 15 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Padawer in view of Stallabrass (U.S. Pat. No. 3,940,622).

Claim 15 again requires that at least some of the sensors be located at different distances from the emitter. The Applicant reiterates that Padawer does not teach detection by an array of sensors being located at different distances from the emitter. In fact, Padawer teaches away from the claimed invention. Padawer teaches having all of the sensors at an equal distance from the emitter. This eliminates the advantages of having an array of sensors with at least some of the sensors being located at different distances from the emitter as described above. Strallabrass does not satisfy this deficiency of Padawer.

The Office also rejected dependent claims 9-14 and 16-24. Claims 9-14 and 16-24 depend from independent claims 8 and 15, respectively, which Applicant believes are allowable over

Padawer. The cited references in each of the obviousness rejections do not satisfy the deficiencies in Padawer. Therefore, Applicant respectfully asserts that claims 9-14 and 16-24 are allowable over the cited references.

Accordingly, withdrawal of the rejection of claims 9-24 under 35 U.S.C. § 103(a) is respectfully requested.

Conclusion

In view of the remarks above, it is believed that the application is in condition for allowance. However, the Examiner is invited to contact the undersigned attorney by telephone if doing so would expedite the allowance of this application.

Additional fees are believed to be due for a two-month extension of time. Please charge these fees to Deposit Account 17-0055. It is not believed that any other additional fees are due. However, in the event that other fees are due, including fees for an additional extension of time, please charge them to this deposit account.

Respectfully submitted,

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